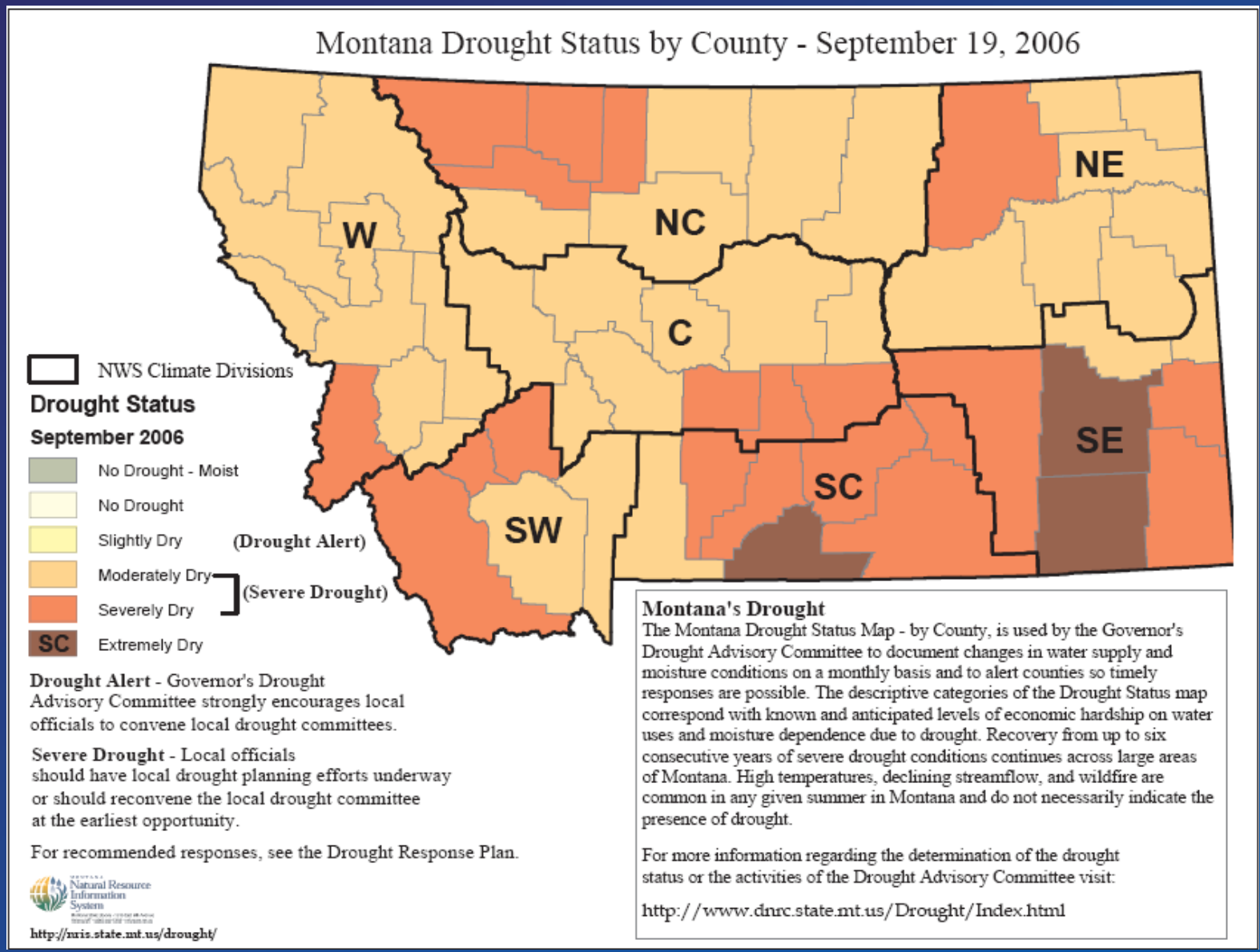
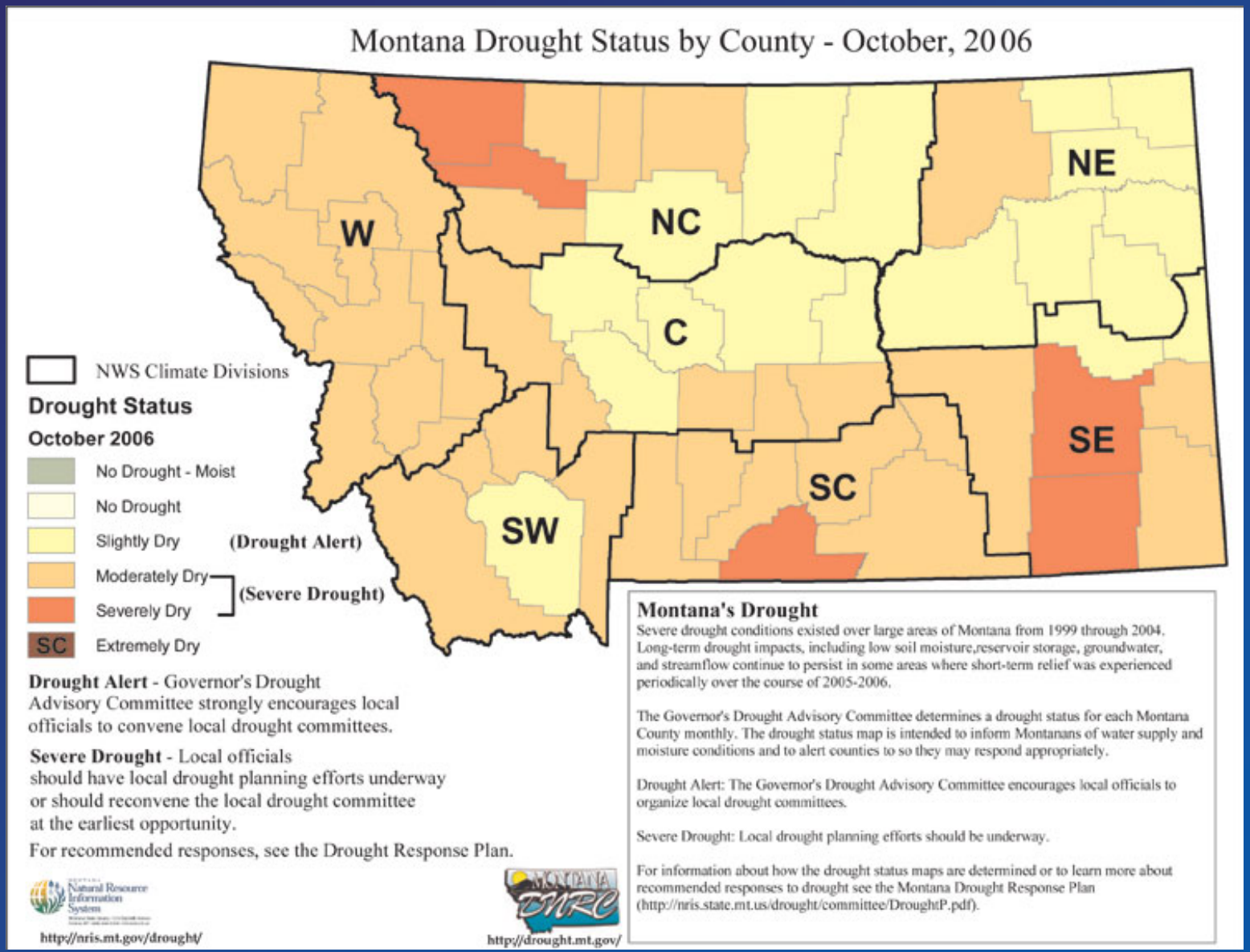
Montana Drought Status - September



Montana Drought Status - October



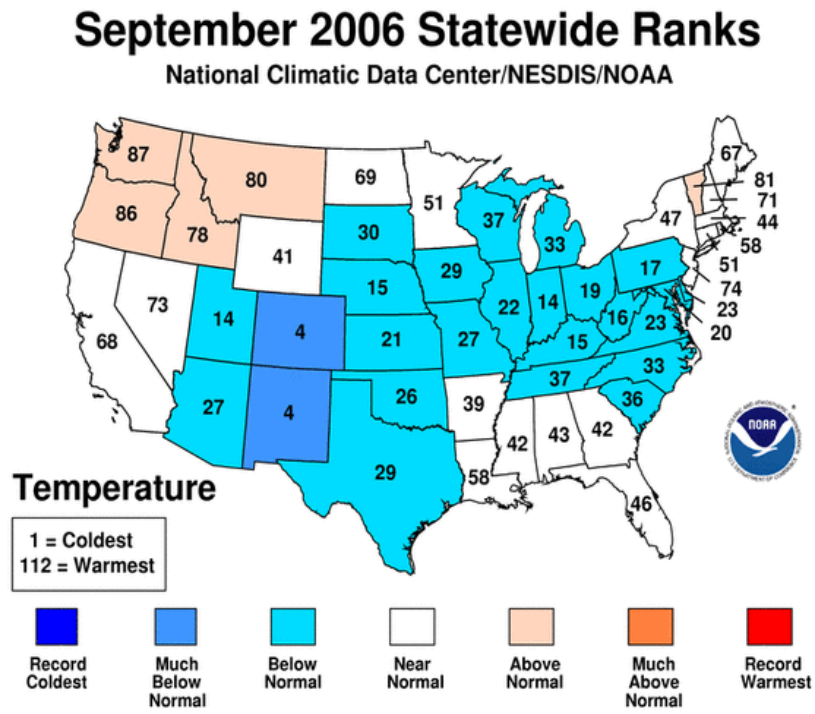
Governor's Drought Advisory Committee Meeting

October 19, 2006

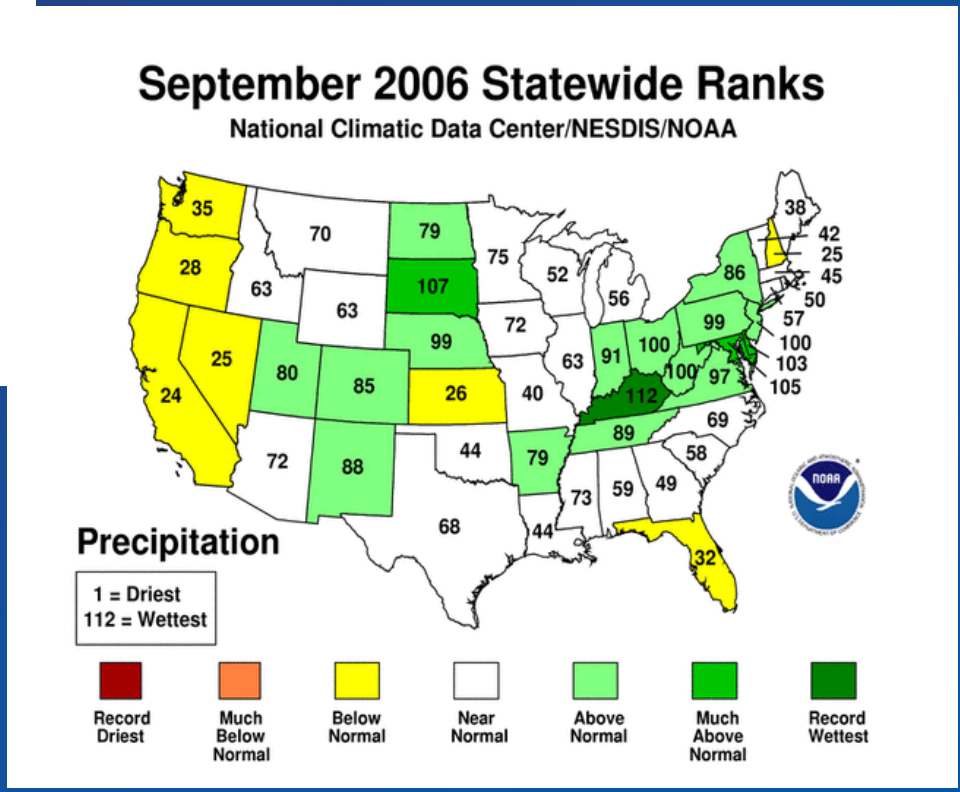
National Weather Service

Gina Loss

September 2006
Warm with near normal precipitation

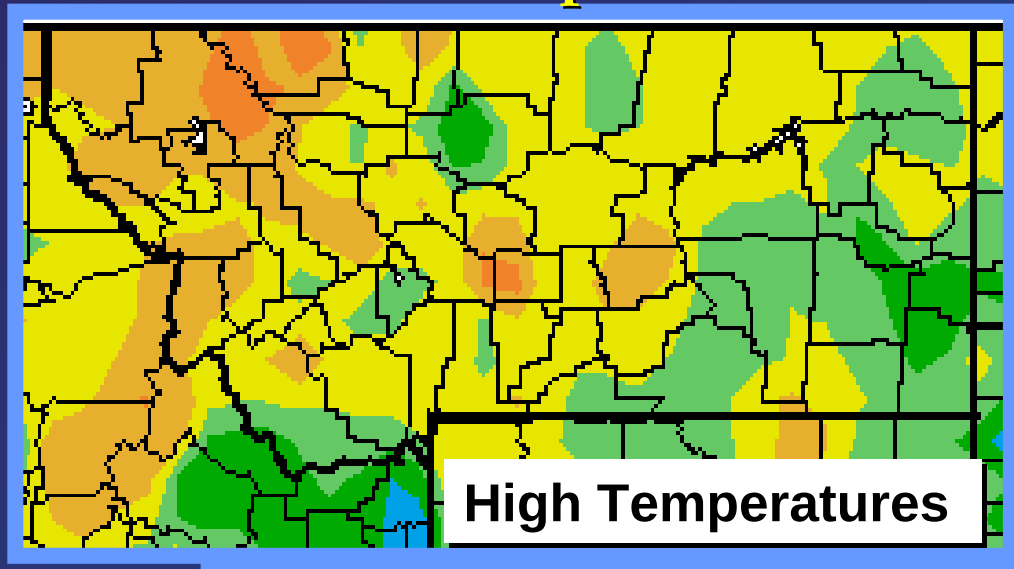


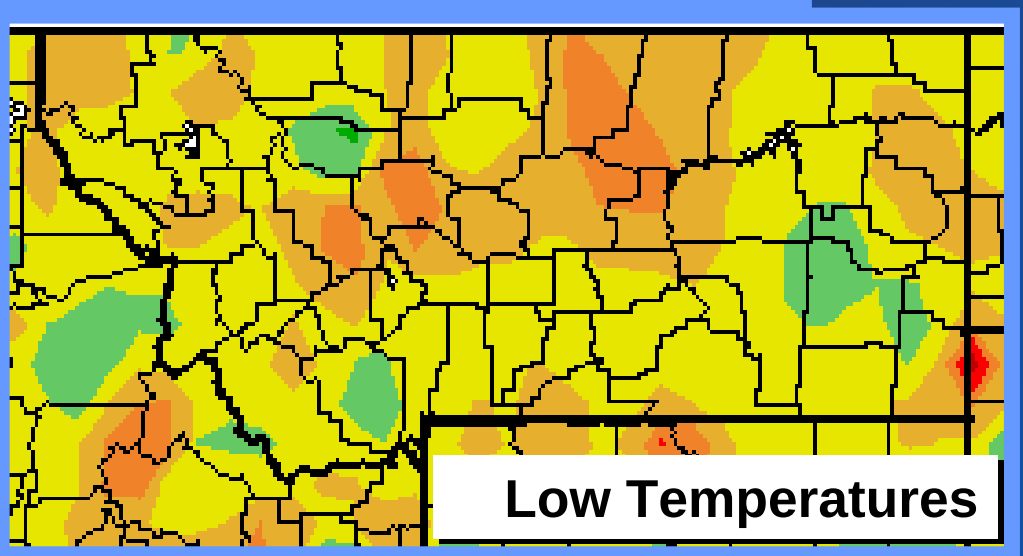
- 33rd warmest of 112 years
- 43rd wettest... 70th driest

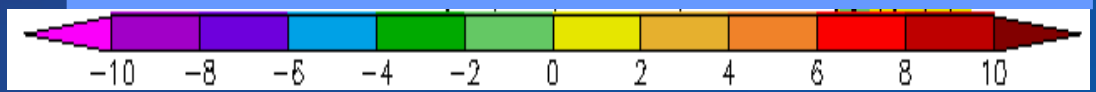


September Temperature Anomalies

September 3 – October 2, 2006





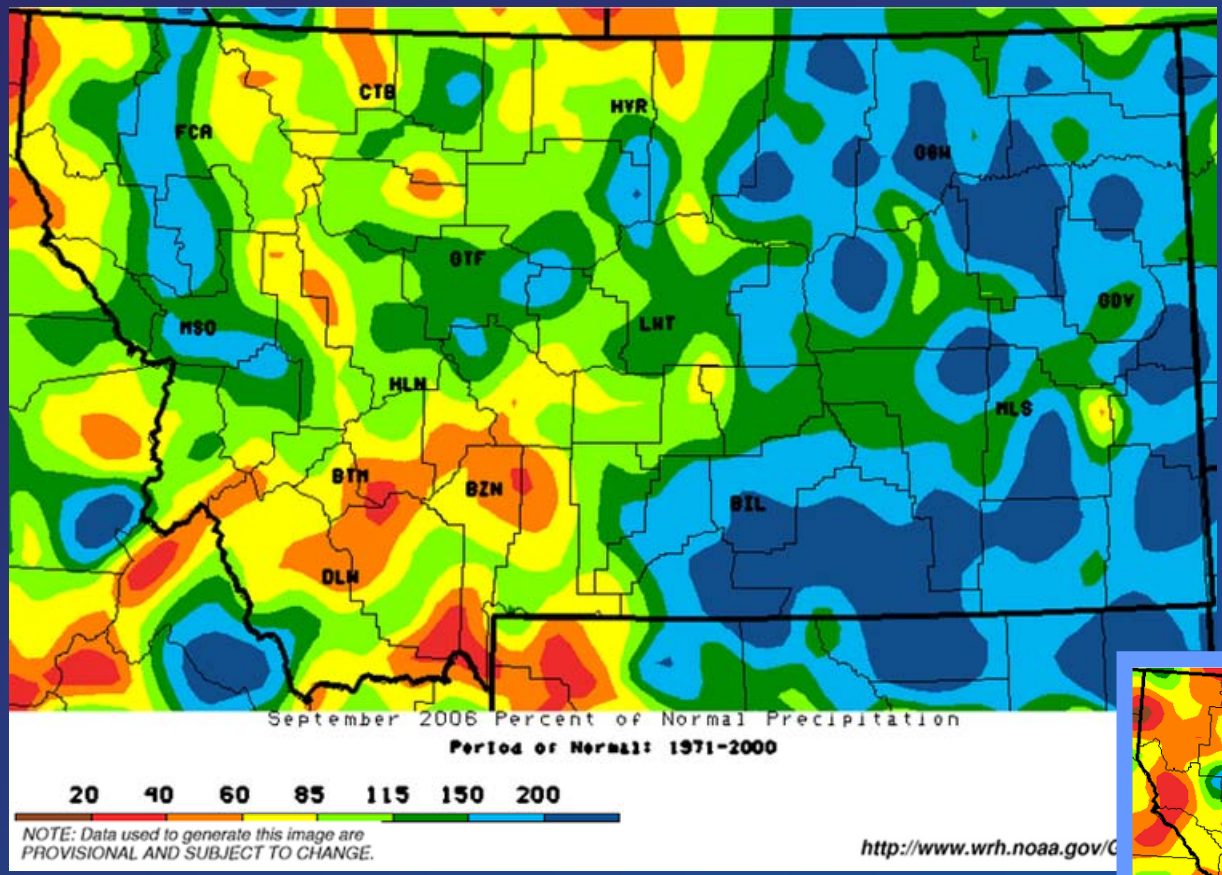


- **Highs**
  - *East of the divide – mostly near normal*
  - *West of the divide – 2 to 6 degrees above normal*
- **Lows**
  - *North – pockets 2 to 6 degrees above normal*
  - *South – mostly near normal*

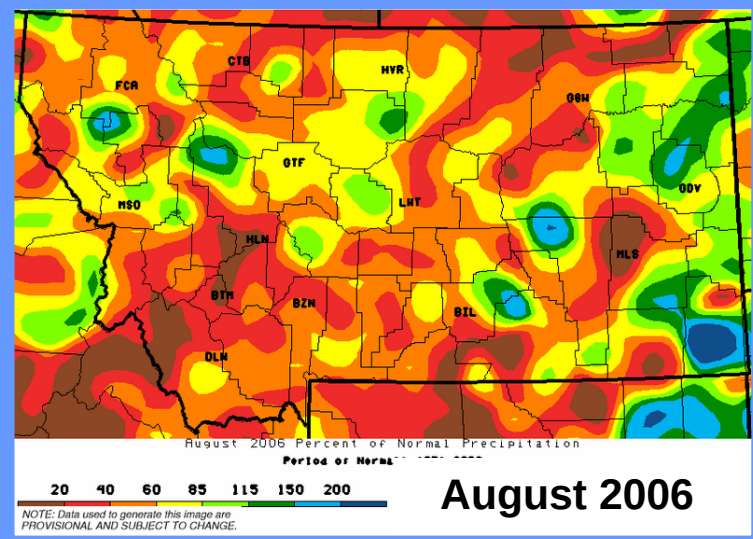
Western Region Climate Center

Percent of Normal Precipitation

September 2006



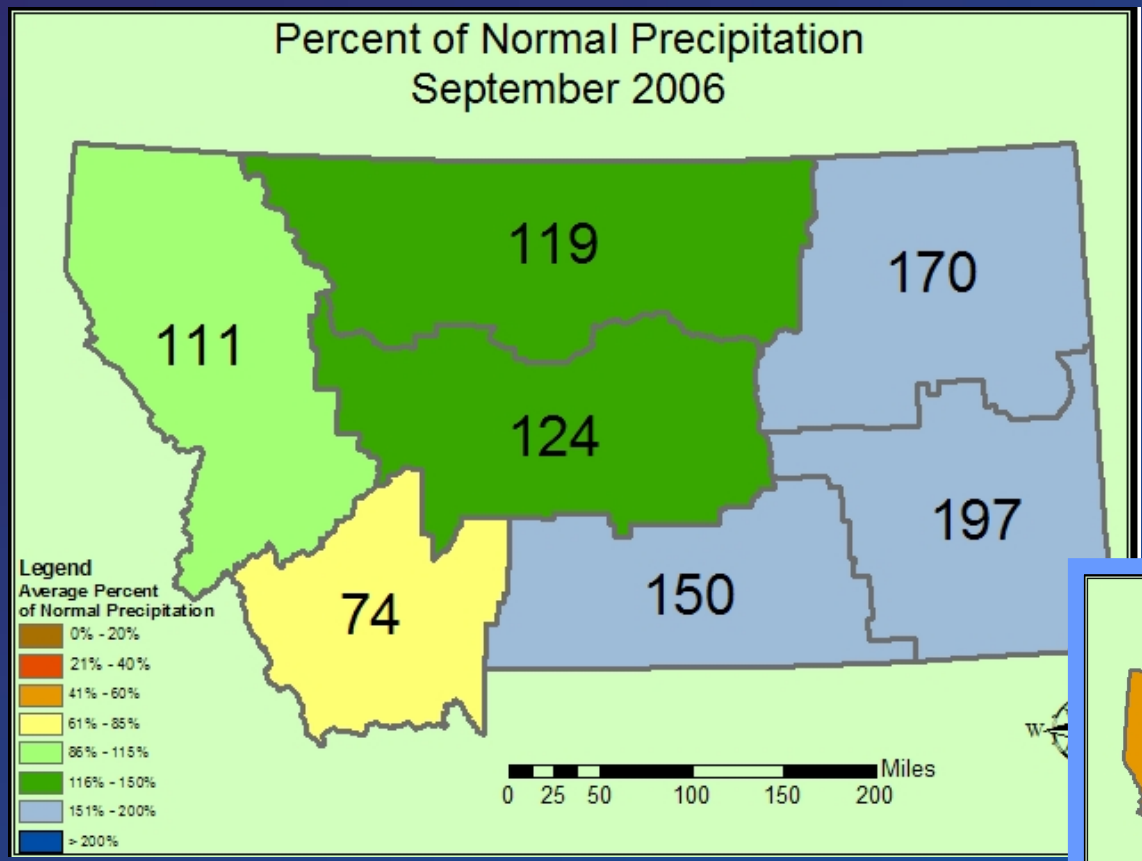
- Most of Montana at least near average
- Most of eastern Montana received more than 150% of normal
- Only isolated areas below normal



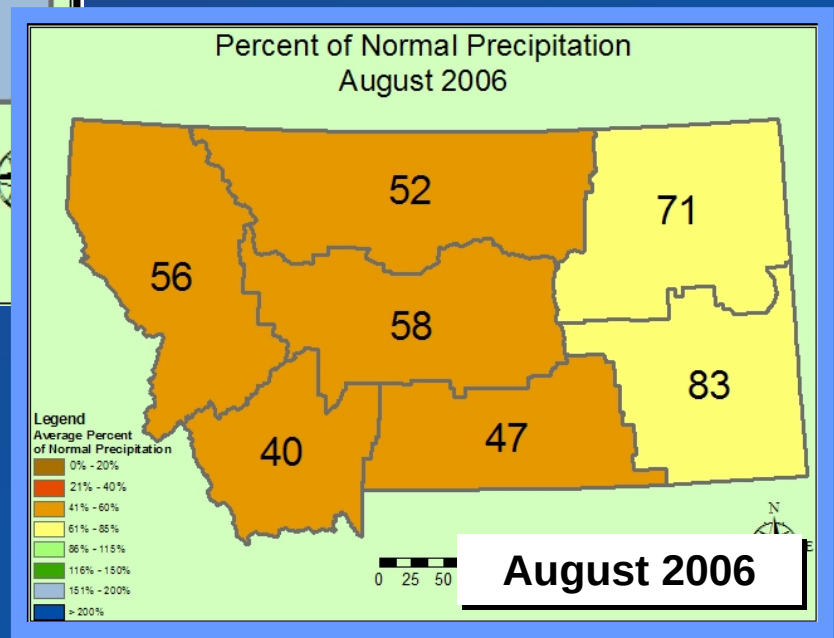
August 2006

Percent of Normal Precipitation

By Climate Division ~ September 2006



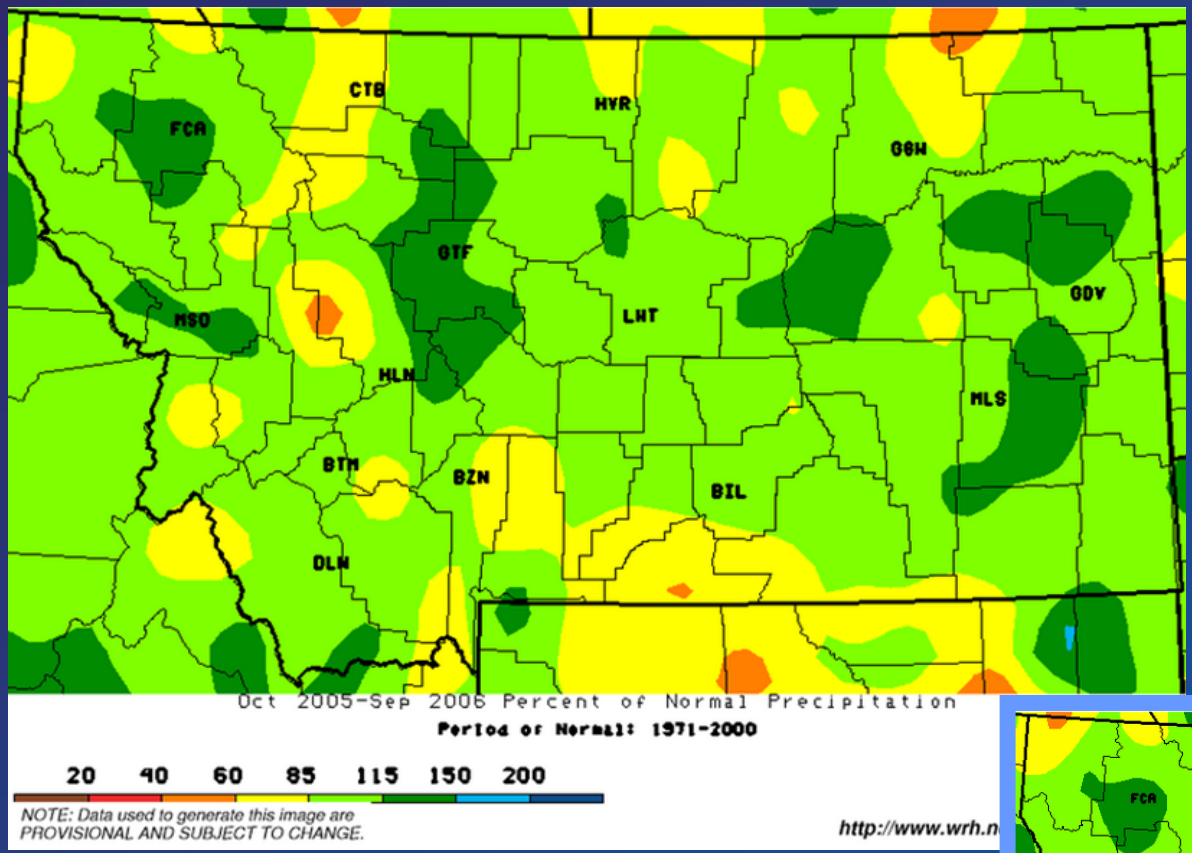
- Five climate divisions above to well above normal
  - *North central*
  - *Central*
  - *South central*
  - *Northeast*
  - *Southeast*
- One division near normal
  - *West*
- One division below normal
  - *Southwest*



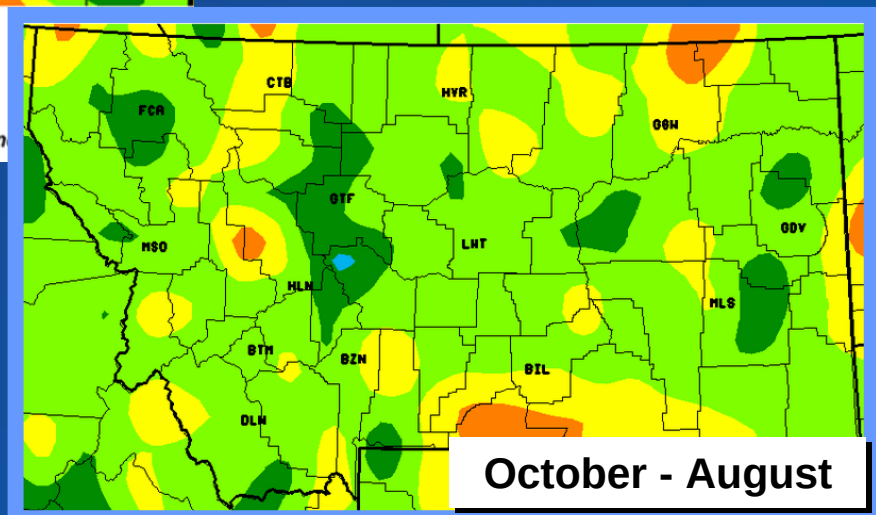
NOAA National Weather Service – Great Falls WFO

Percent of Normal Precipitation

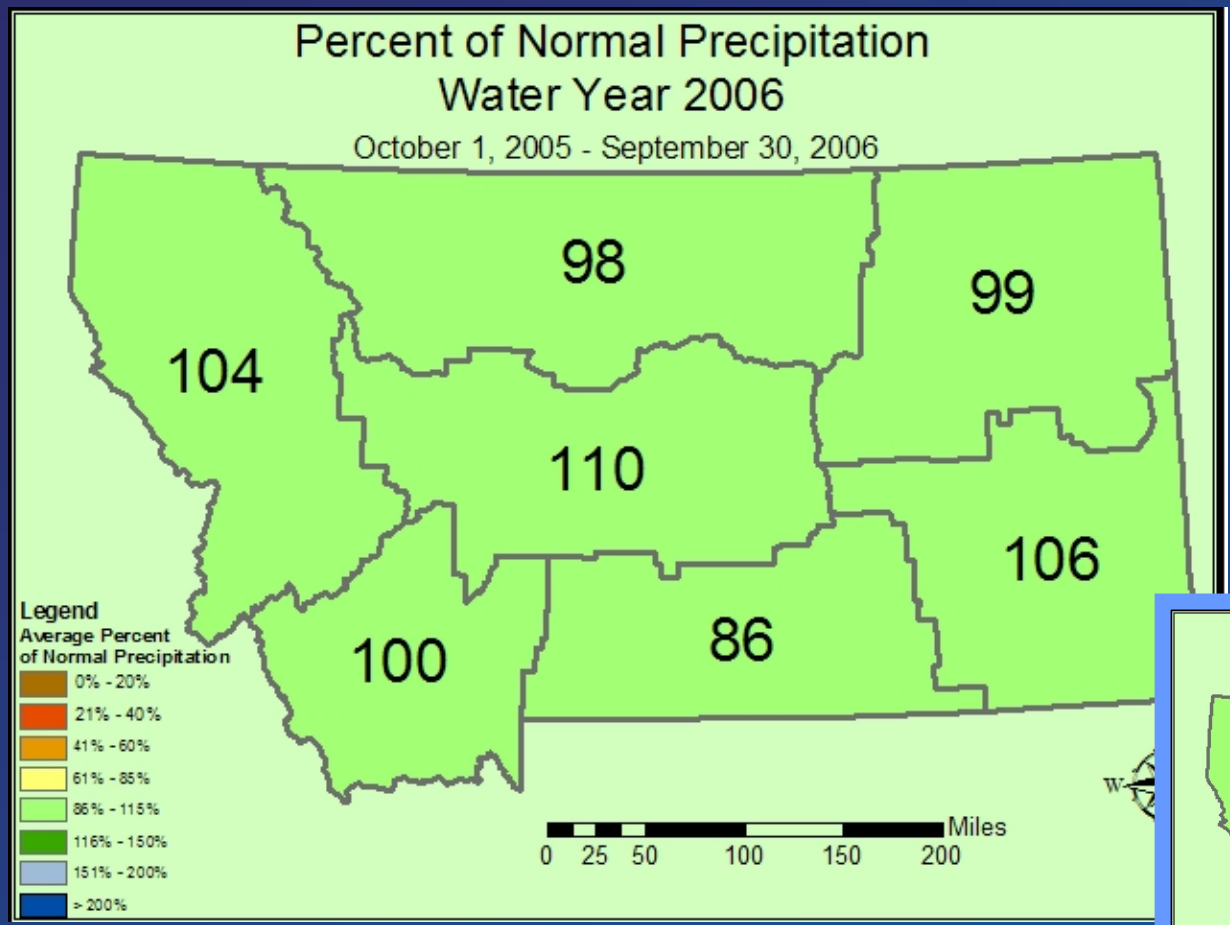
Water Year 2006



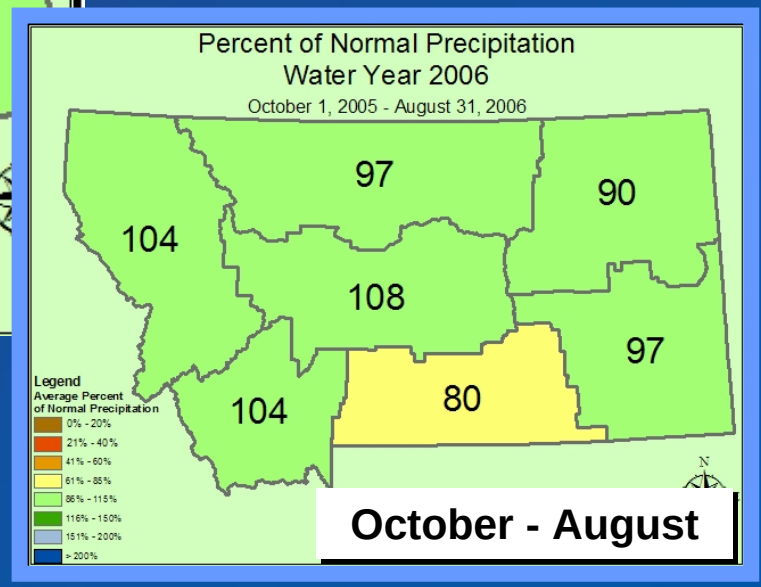
- October – September
- Most of Montana ended the water year near normal
  - *Small pockets above normal*
  - *Small pockets below normal*



Percent of Normal Precipitation
By Climate Division ~ Water Year 2006



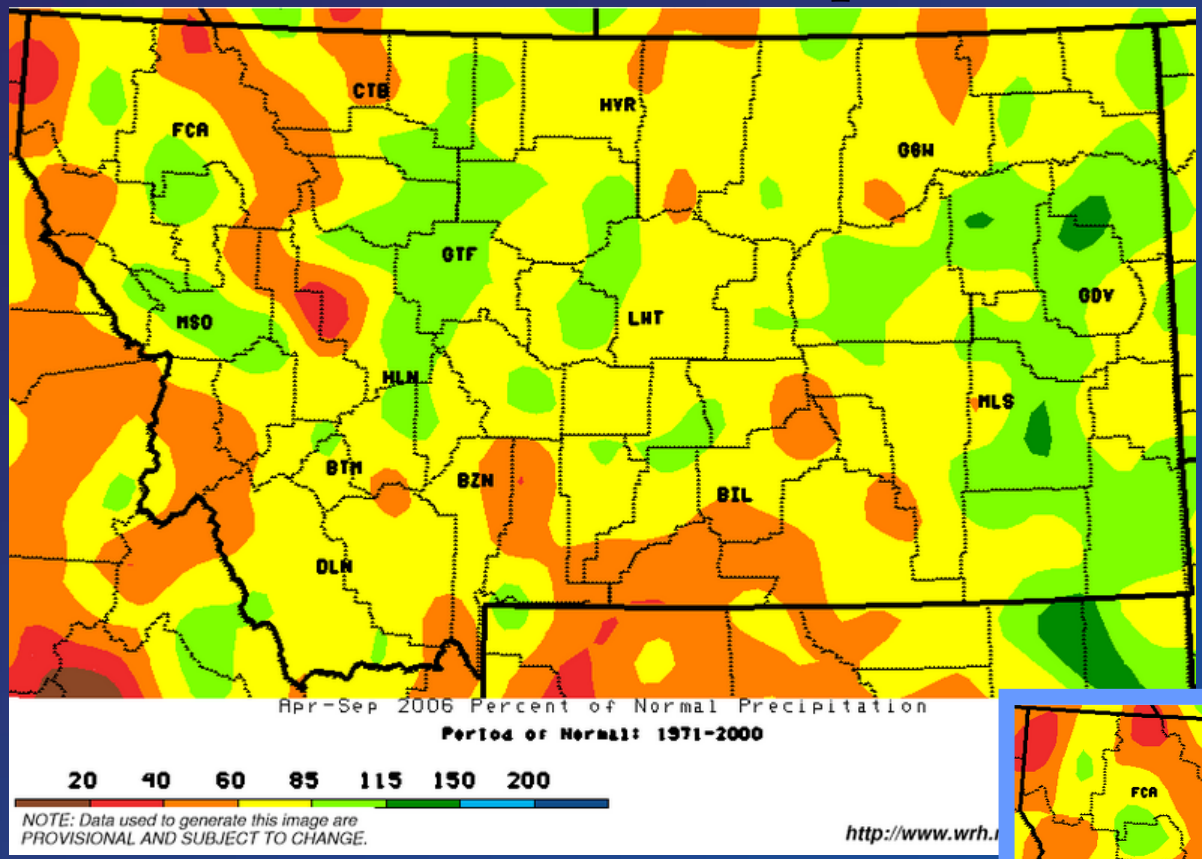
- October – September
- All divisions ended 'near normal'



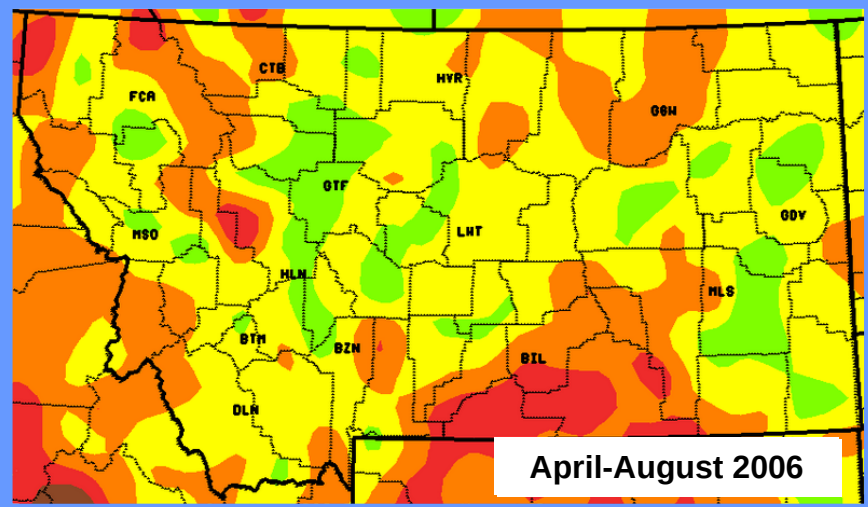
NOAA National Weather Service – Great Falls WFO

Percent of Normal Precipitation

Crop Year 2006

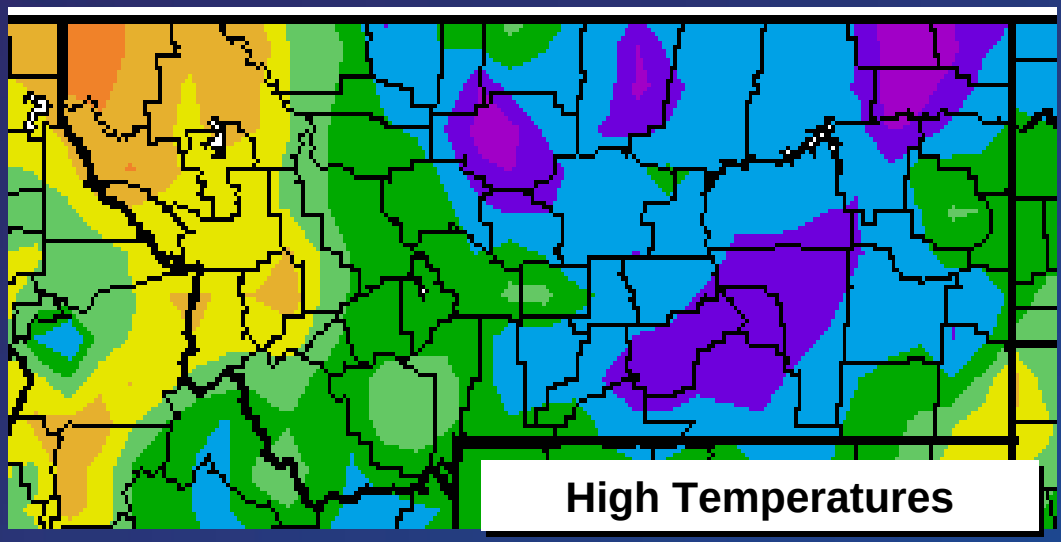


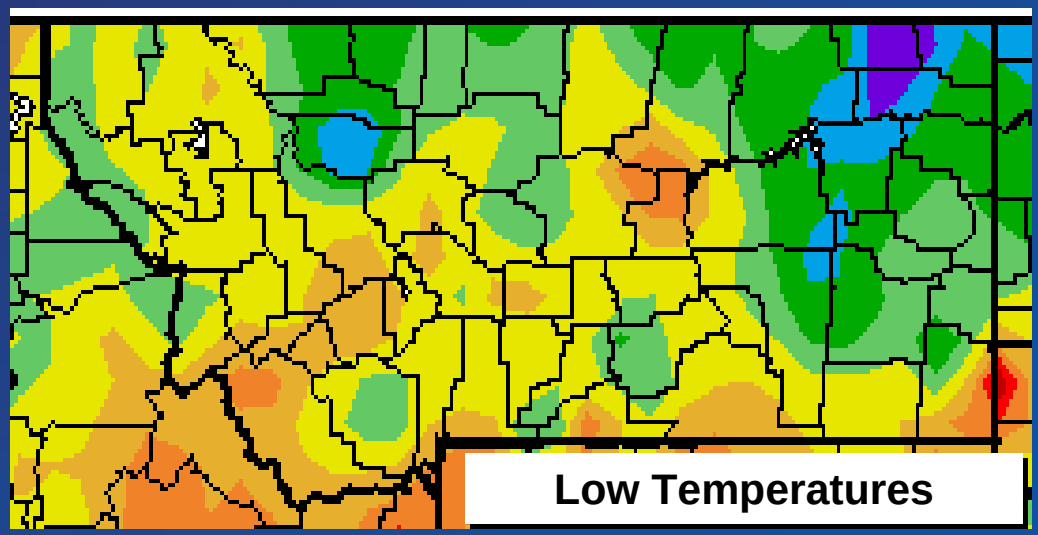
- April – September
- Most of Montana below to well below average
  - *Notable improvement in south central... east and northeast*



Departure from Average Temperature

October 1 – 17

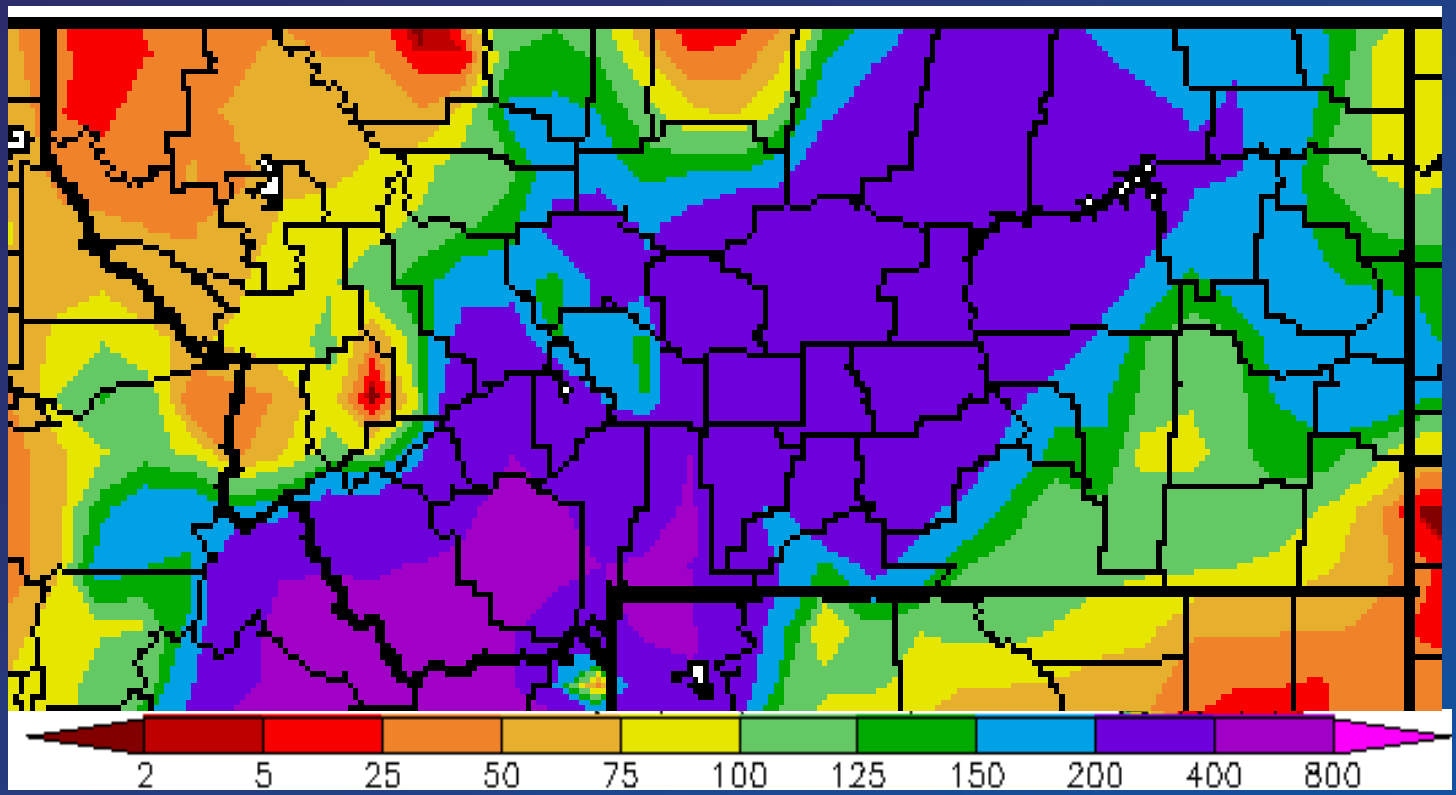




- West of the divide – Near to above normal
  - *Highs – 2 to 6 degrees above normal extreme northwest... near normal elsewhere*
  - *Lows – Near normal*
- East of the divide – Near to below normal
  - *Highs – 4 to 10 degrees below normal central and east*
  - *Lows – 2 to 8 degrees below normal north and east*

Percent of Average Precipitation

October 1 - 17, 2006



- Series of storms brought widespread precipitation to the state... especially band from southwest to central to northeast
  - *Large areas at 200% or more of normal*
- Northwest and southeast drier
  - *Areas at less that 25% of normal northwest*

Precipitation Totals

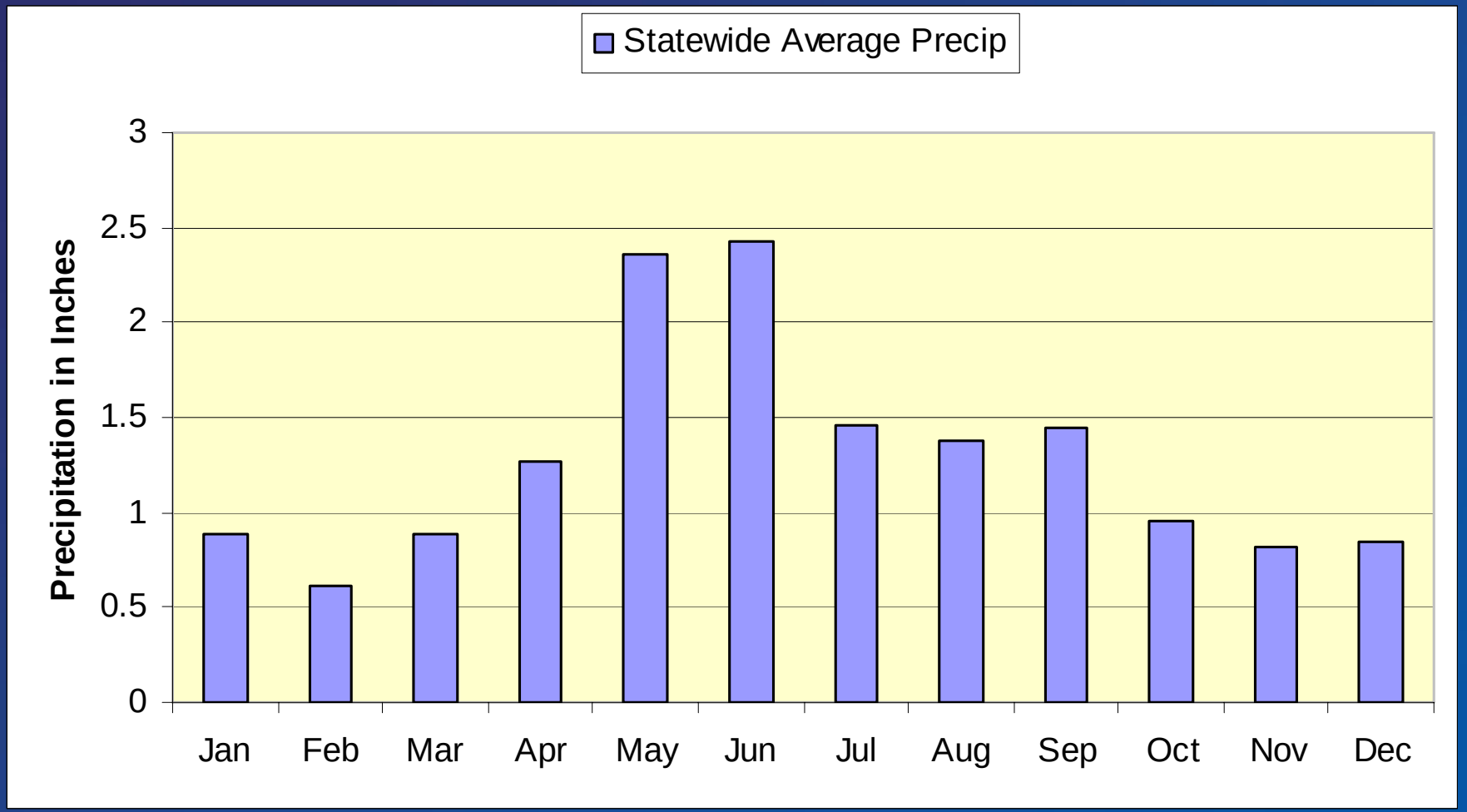
October and Water Year 2006

	OCTOBER 1 – 17				WATER YEAR TO DATE			
	ACTUAL PCPN	NRML PCPN	+/- NRML	% OF NRML	ACTUAL PCPN	NRML PCPN	+/- NRML	% OF NRML
WESTERN MONTANA								
BUTTE	1.50	0.51	0.99	294	1.50	0.51	0.99	294
KALISPELL	0.22	0.51	-0.29	43	0.22	0.51	-0.29	43
MISSOULA	0.42	0.34	0.08	124	0.42	0.34	0.08	124
MULLAN PASS	0.63	1.77	-1.14	36	0.63	1.77	-1.14	36
SOUTHWEST MONTANA								
BIG SKY	2.08	0.85	1.23	245	2.08	0.85	1.23	245
BOULDER	1.22	0.34	0.88	359	1.22	0.34	0.88	359
BELGRADE FIELD	2.31	0.68	1.63	340	2.31	0.68	1.63	340
BOZEMAN MSU	3.18	0.93	2.25	342	3.18	0.93	2.25	342
DILLON AIRPORT	1.51	0.37	1.14	408	1.51	0.37	1.14	408
ENNIS	2.80	0.60	2.20	467	2.80	0.60	2.20	467
HELENA	1.07	0.35	0.72	306	1.07	0.35	0.72	306
ROGERS PASS 9 NNE	1.24	0.73	0.51	170	1.24	0.73	0.51	170
TOWNSEND	0.97	0.34	0.63	285	0.97	0.34	0.63	285
W YELLOWSTONE	1.71	0.68	1.03	251	1.71	0.68	1.03	251
WISDOM	1.00	0.43	0.57	233	1.00	0.43	0.57	233

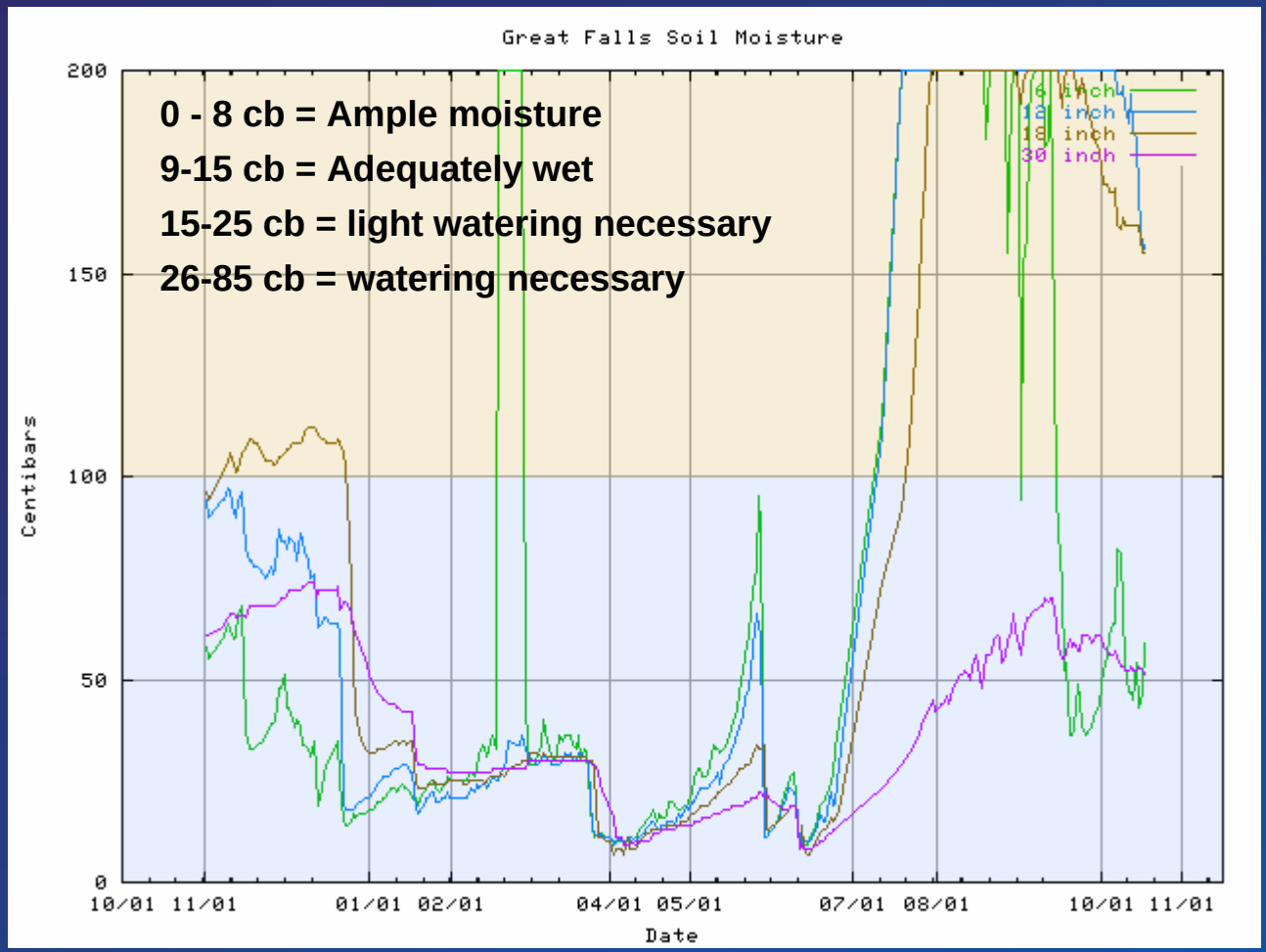
Precipitation Totals
October and Water Year 2006

	OCTOBER 1 - 17				WATER YEAR TO DATE			
	ACTUAL PCPN	NRML PCPN	+/- NRML	% OF NRML	ACTUAL PCPN	NRML PCPN	+/- NRML	% OF NRML
CENTRAL MONTANA								
BILLINGS	1.78	0.75	1.03	237	1.78	0.75	1.03	237
CASCADE 20 SSE	0.75	0.58	0.17	129	0.75	0.58	0.17	129
CHINOOK	0.71	0.44	0.27	161	0.71	0.44	0.27	161
CHOTEAU	0.40	0.34	0.06	118	0.40	0.34	0.06	118
CUT BANK	0.05	0.33	-0.28	15	0.05	0.33	-0.28	15
FORT ASSINNIBOINE	0.35	0.49	-0.14	71	0.35	0.49	-0.14	71
FORT BENTON	0.84	0.51	0.33	165	0.84	0.51	0.33	165
GOLD BUTTE 7 N	0.54	0.46	0.08	117	0.54	0.46	0.08	117
GRASS RANGE	1.98	0.54	1.44	367	1.98	0.54	1.44	367
GREAT FALLS	1.28	0.53	0.75	242	1.28	0.53	0.75	242
HARLEM	0.81	0.41	0.40	198	0.81	0.41	0.40	198
HAVRE	0.30	0.37	-0.07	81	0.30	0.37	-0.07	81
LIVINGSTON	2.90	0.71	2.19	408	2.90	0.71	2.19	408
LEWISTOWN	2.01	0.64	1.37	314	2.01	0.64	1.37	314
MARTINSDALE 3 NNW	1.41	0.49	0.92	288	1.41	0.49	0.92	288
NEIHART 8 NNW	2.46	0.82	1.64	300	2.46	0.82	1.64	300
SHELBY	0.13	0.22	-0.09	59	0.13	0.22	-0.09	59
STANFORD	2.04	0.59	1.45	346	2.04	0.59	1.45	346
SWEET GRASS	0.52	0.41	0.11	127	0.52	0.41	0.11	127
VALIER	0.52	0.36	0.16	144	0.52	0.36	0.16	144
WHITE SULPHUR SPRGS	0.83	0.61	0.22	136	0.83	0.61	0.22	136
EASTERN MONTANA								
GLASGOW	0.95	0.43	0.52	221	0.95	0.43	0.52	221
MILES CITY	0.72	0.68	0.04	106	0.72	0.68	0.04	106

Statewide Average Precipitation



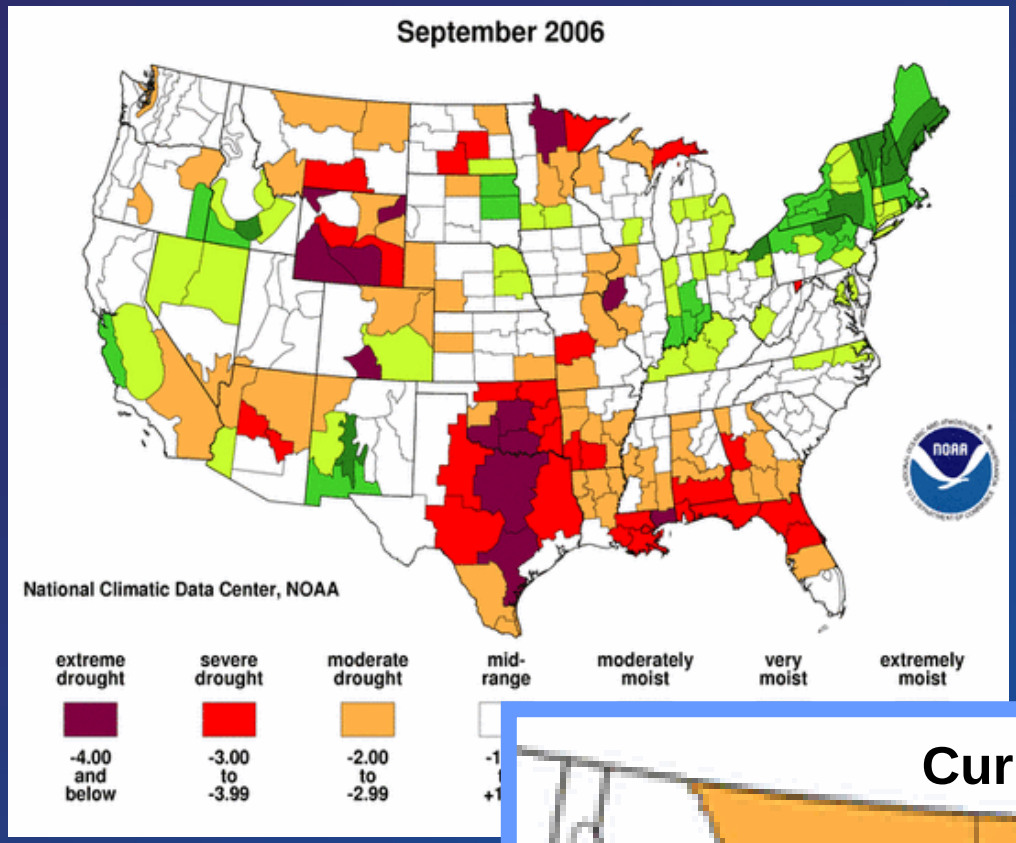
Great Falls Soil Moisture



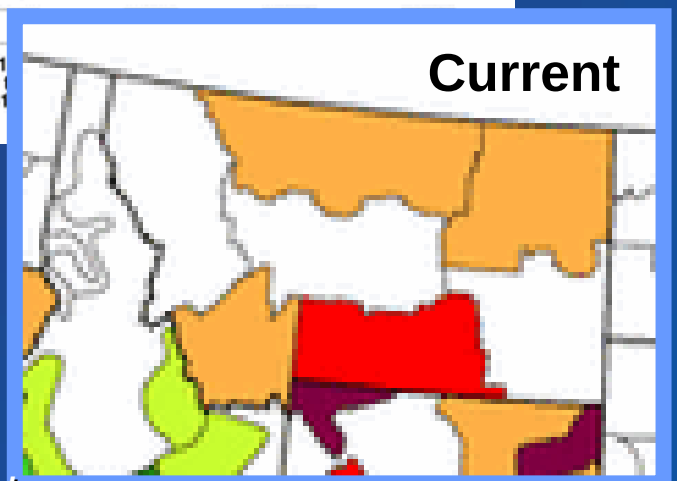
- Nice response to rain at 6”
- Some response at 12” and 18”
- Some response at 30”
- 1.28” since Oct 1

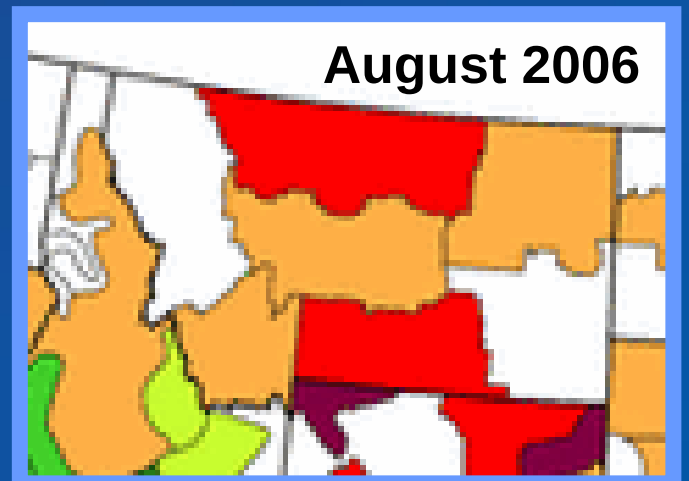
6” = 60 cb
12” = 160 cb
18” = 158 cb
30” = 53 cb

Palmer Hydrological Drought Index
September 2006



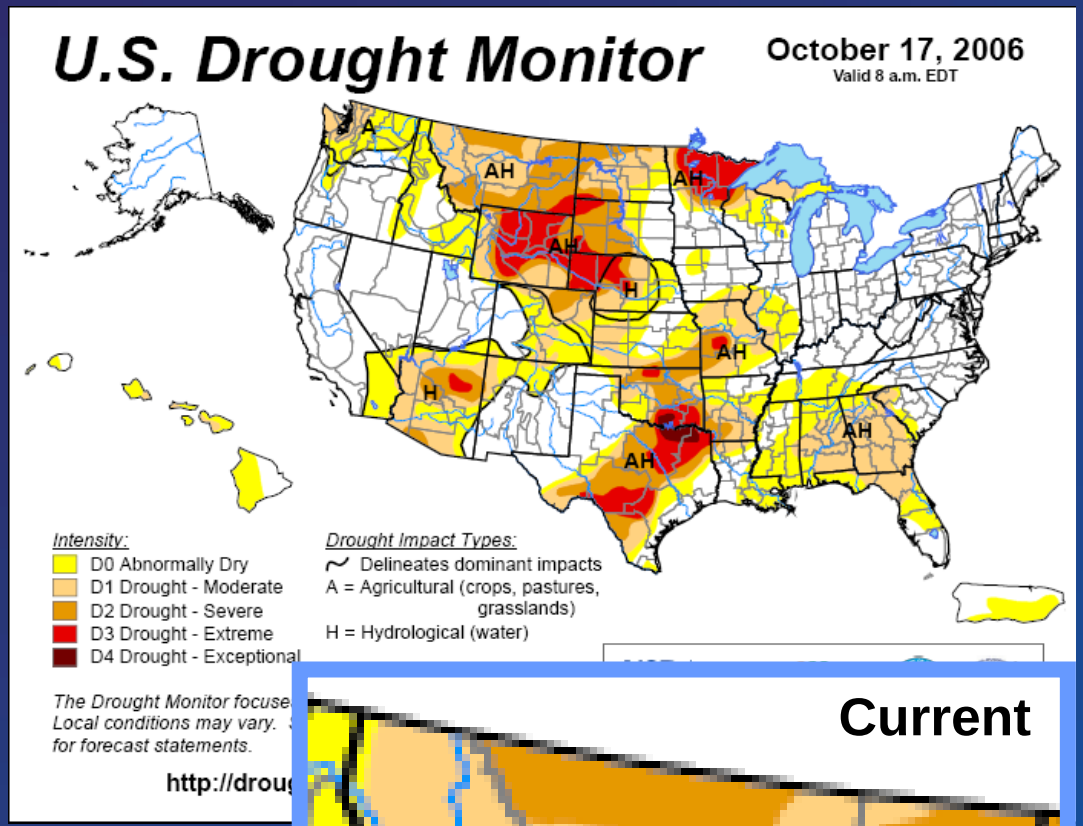
- 2 climate divisions improved a category
  - *North central upgraded from 'Severe' 'to Moderate'*
  - *Central improved from 'Moderate Drought' to Mid-Range'*
- One climate division still in 'Severe Drought'
  - *South central*



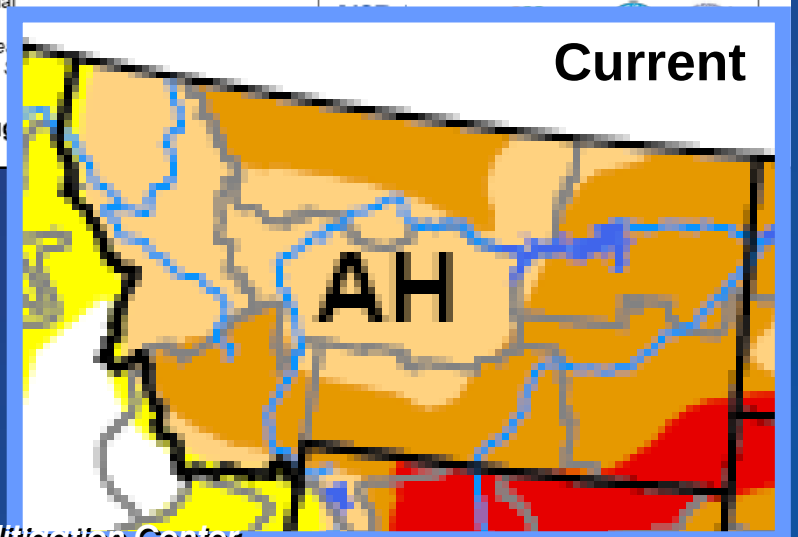


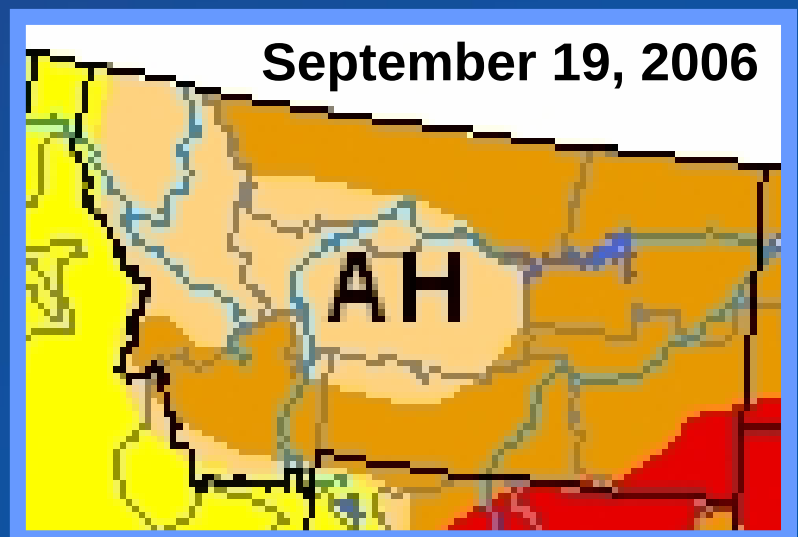
NOAA National Climatic Data Center

National Drought Monitor
October 17, 2006



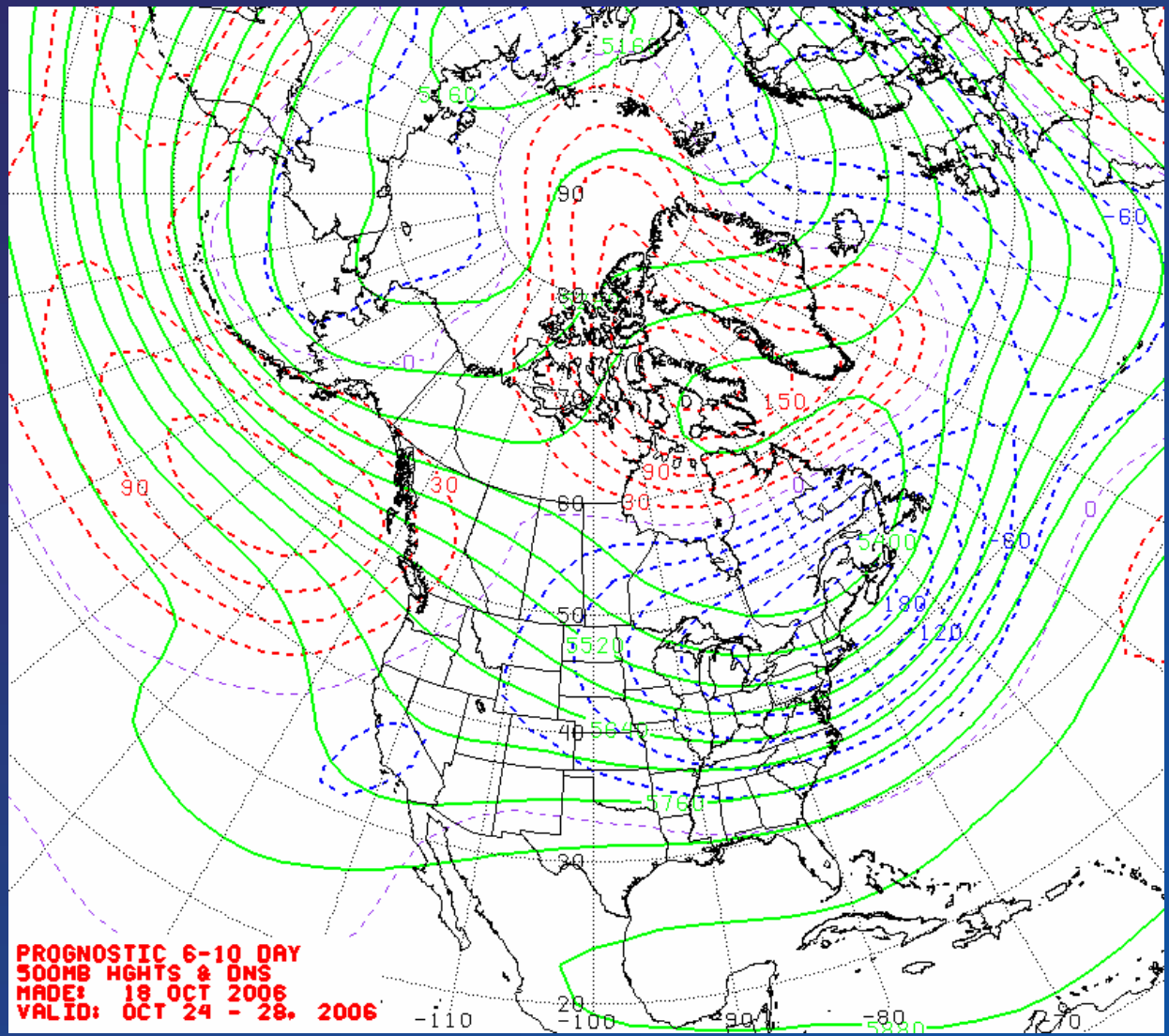
- All of Montana in at least 'Moderate' (D1)
- Some improvement noted in the northeast
  - *Small area improved from Severe (D2) to Moderate (D1)*
- Still some lingering Extreme (D3) in extreme southeast





6 to 10 Day Outlook

500mb Heights and Anomalies

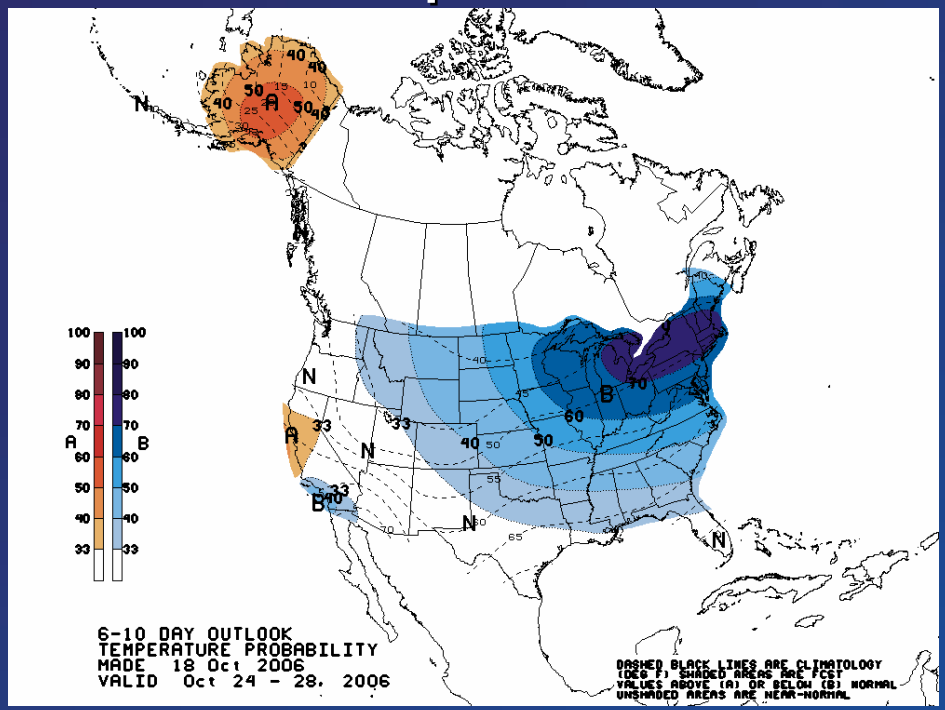


- October 24 - 28
- Low pressure trough over eastern U.S.
- Weak high pressure ridge to the west
- West to northwest flow
- Temperatures below seasonal normals

6 to 10 Day Outlook

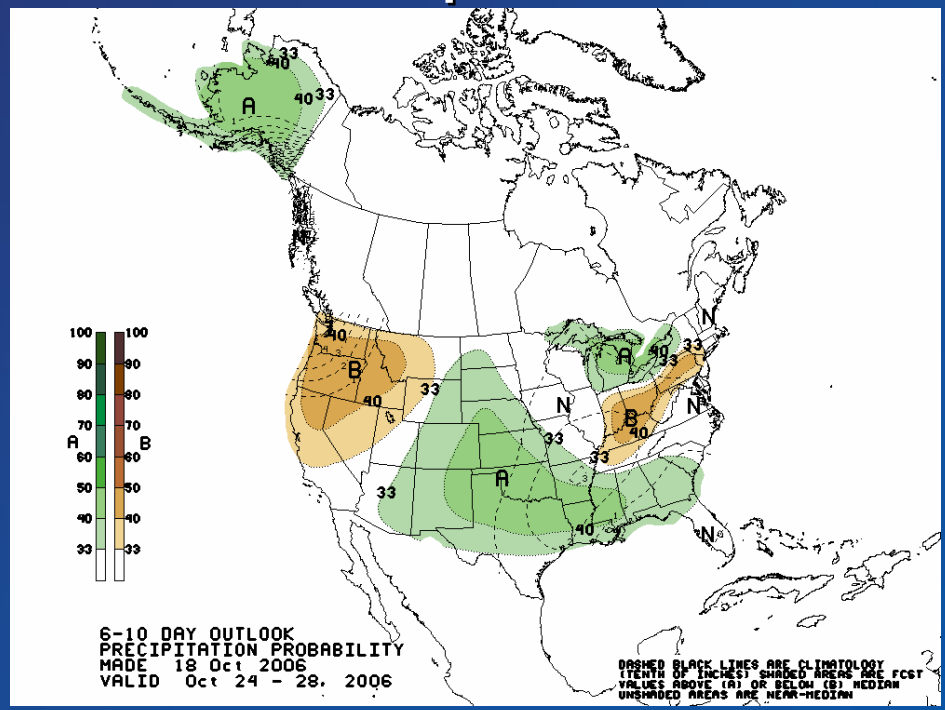
October 24 - 28

Temperature



- 33% to 40% chance for below normal temperatures over western half of Montana
- 40% to 50% chance for below normal temperatures over eastern half of Montana

Precipitation

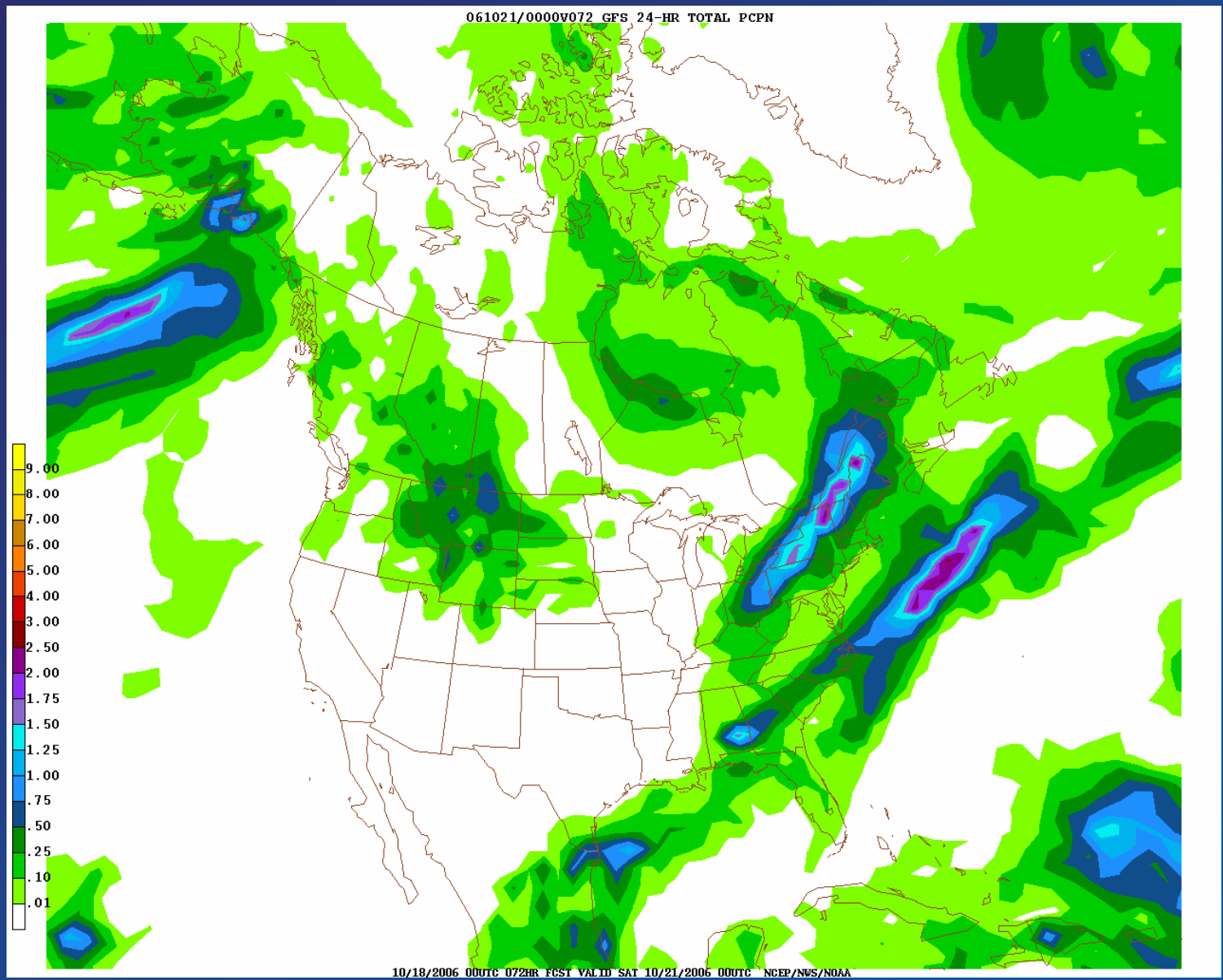


- 33% to 50% chance for below normal precipitation across western Montana
- 33% to 40% chance for above normal precipitation over extreme southeast Montana

NOAA Climate Prediction Center

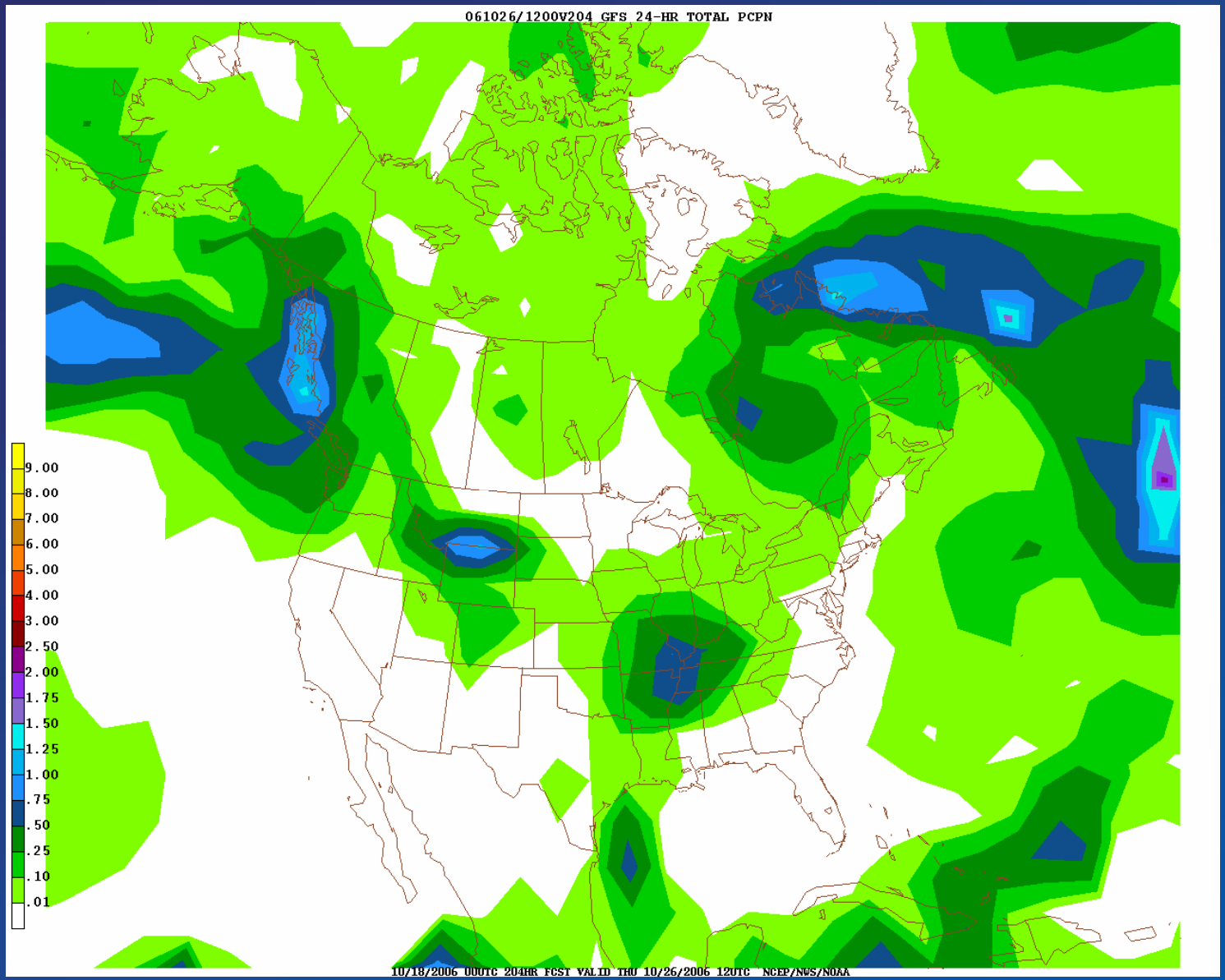
24-hour Precipitation Forecast

October 21



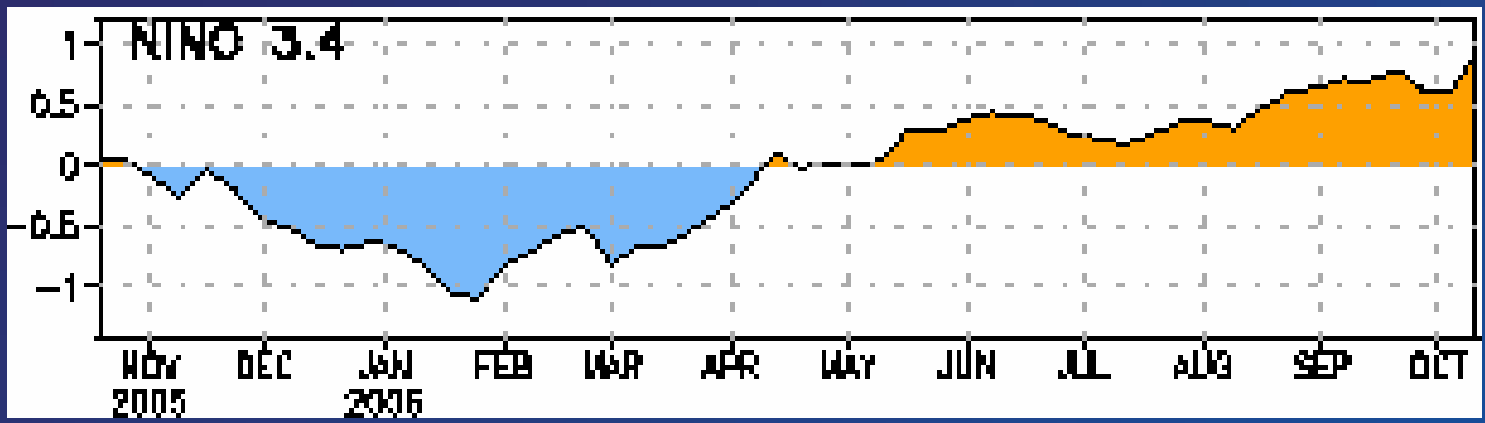
24-hour Precipitation Forecast

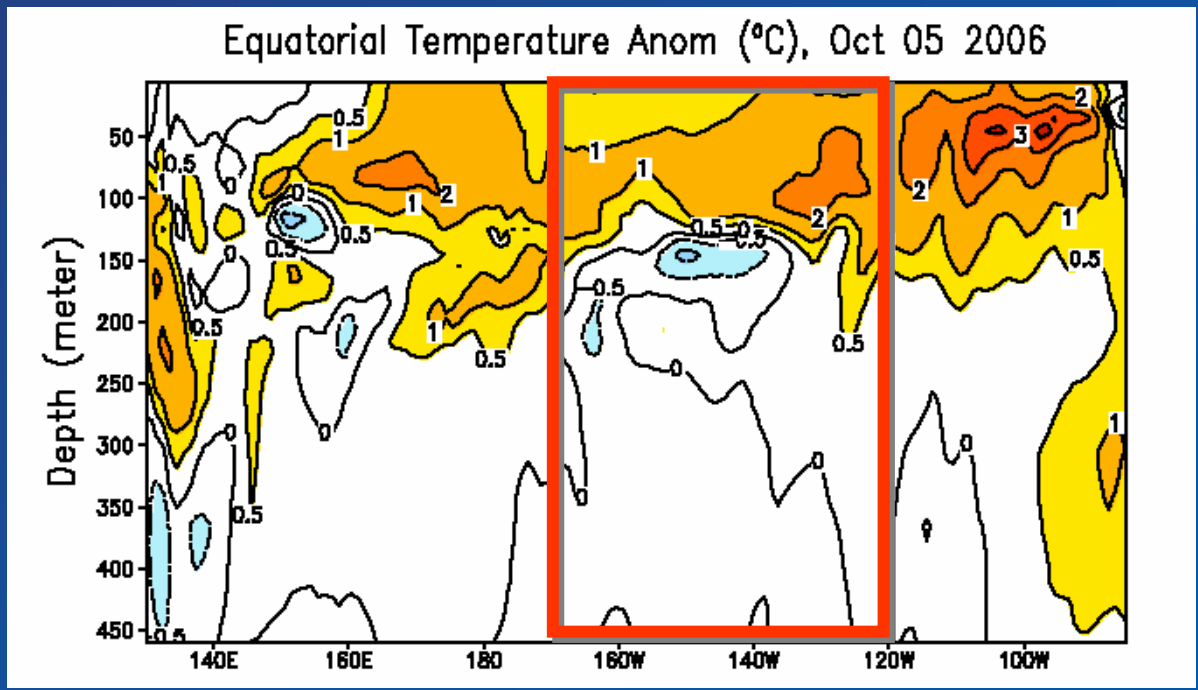
October 26



Current Status of El Niño/La Niña

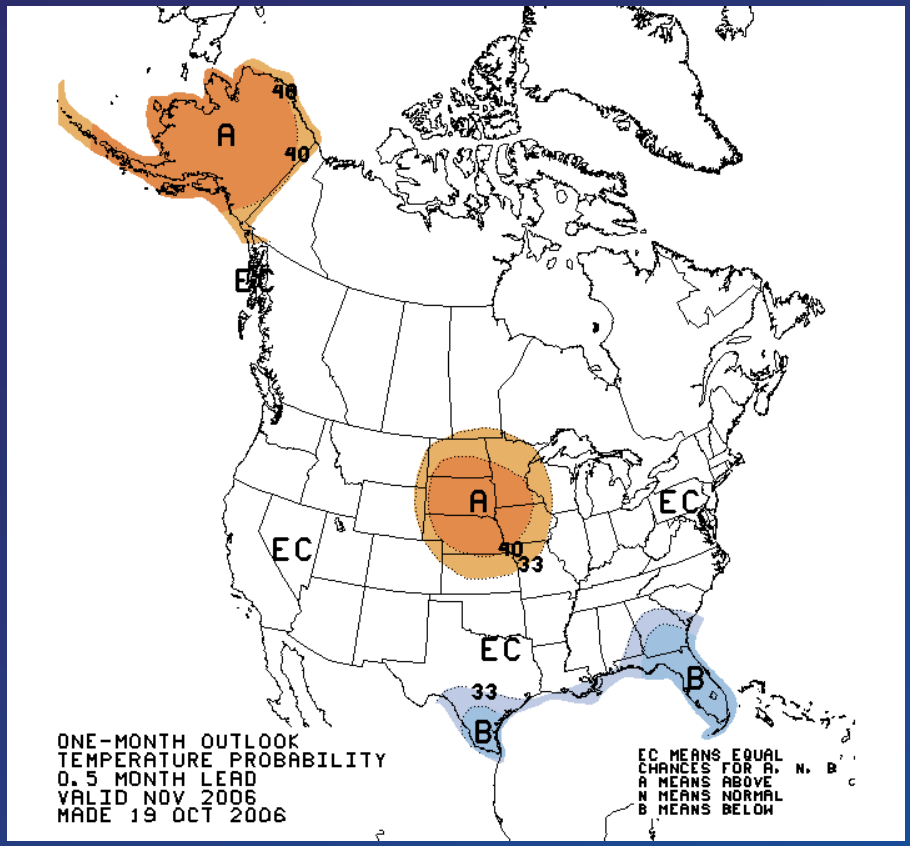
El Niño conditions likely to continue into early 2007





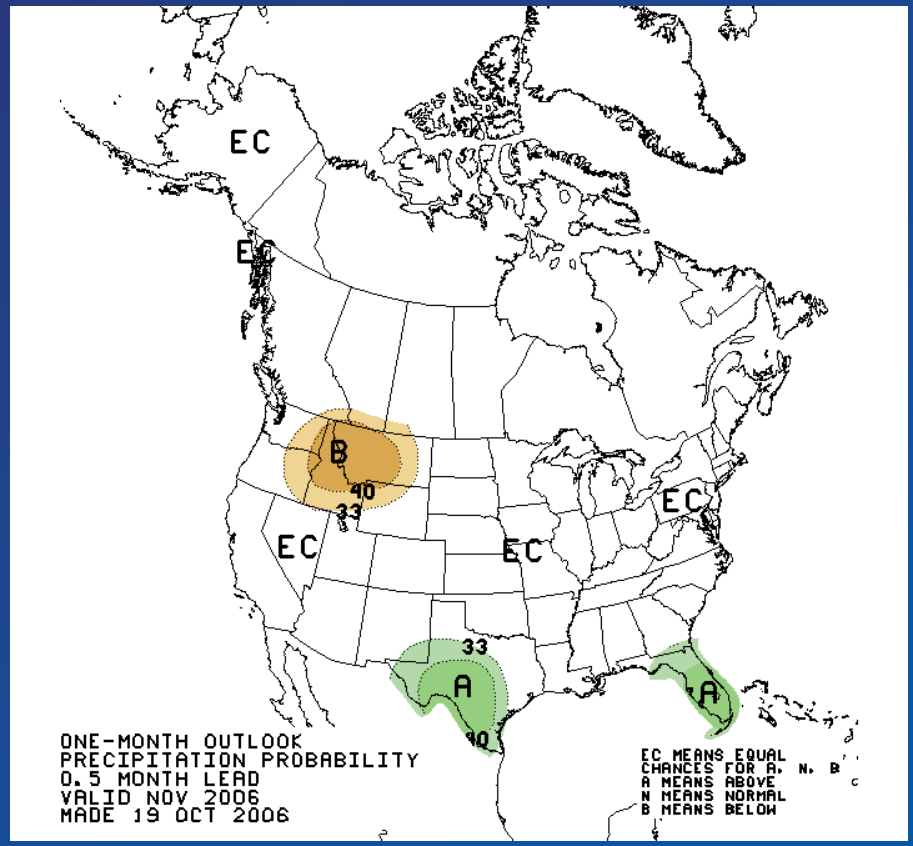
November Outlook

Temperature



- All of Montana – No forecast skill
  - *Equal chances for above... below or near normal temperatures*
- Highs in the upper 30s to mid 40s
- Lows in the upper teens to mid 20s

Precipitation

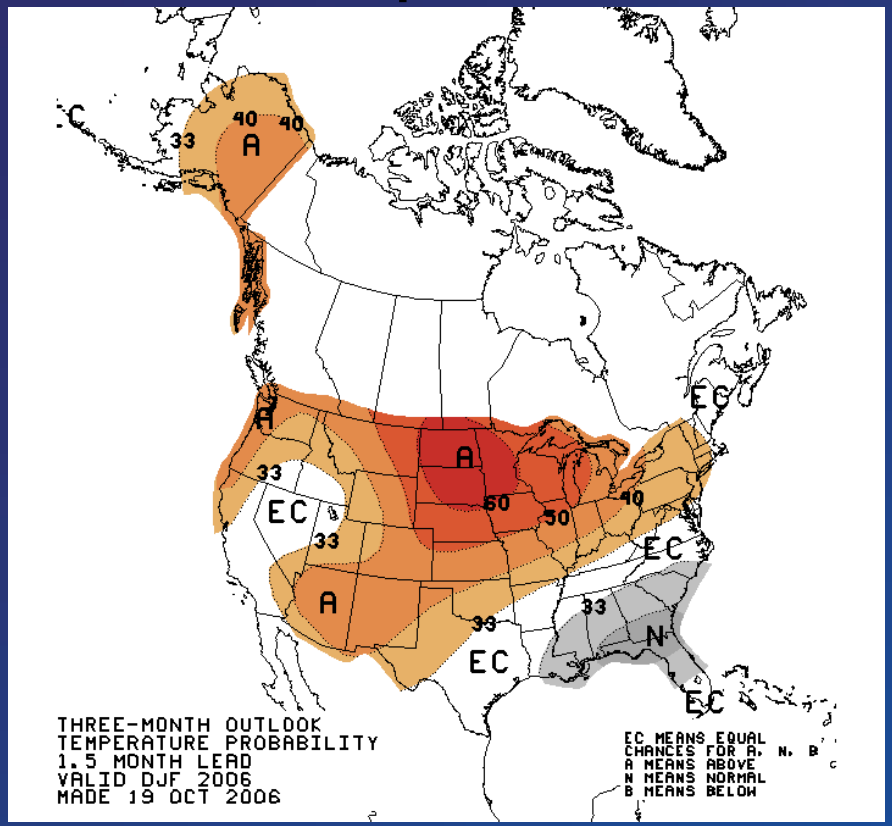


- West and central – 40% to 50% chance of below normal precipitation
- East – 33% to 40% chance of below normal precipitation
- 0.25” to 0.75”
  - *1” to 2” in the mountains*

NOAA Climate Prediction Center

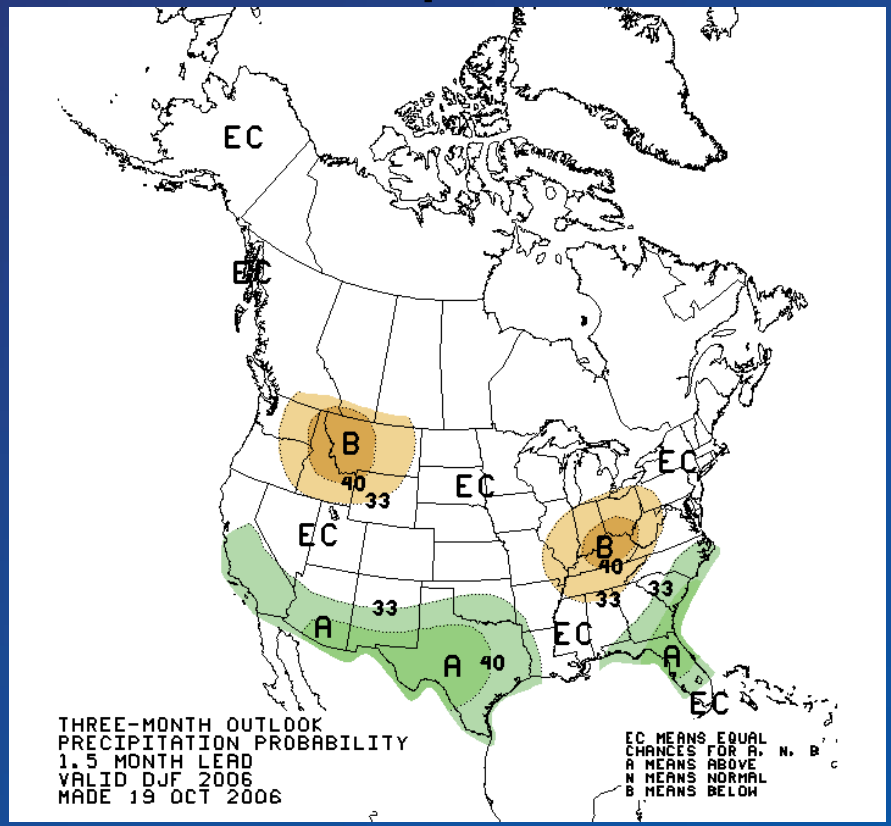
December – February Outlook

Temperature



- West and central – 33% to 50% chance of above normal temperatures
- East – 50% to 60% chance of above normal temperatures

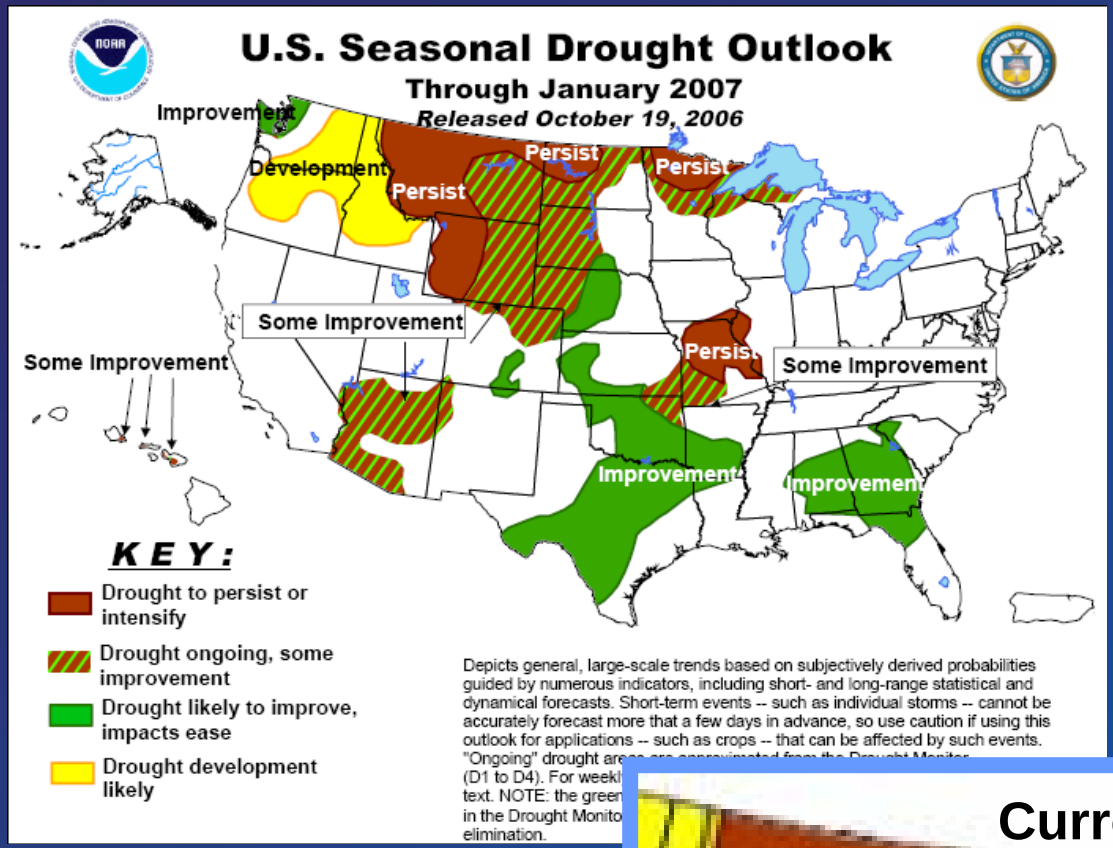
Precipitation



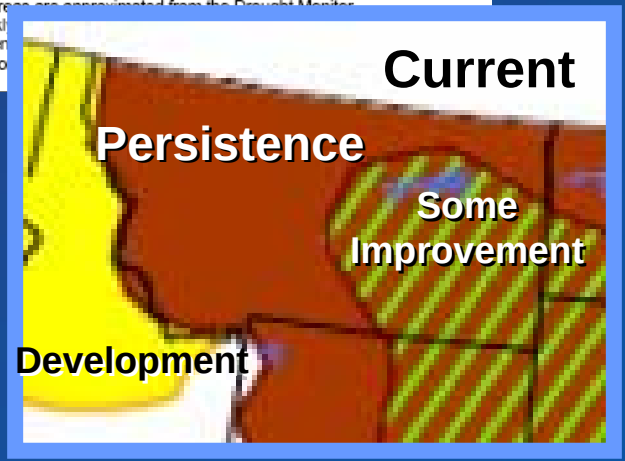
- West – 40% to 50% chance of below normal precipitation
- East – 33% to 40% chance of below normal precipitation

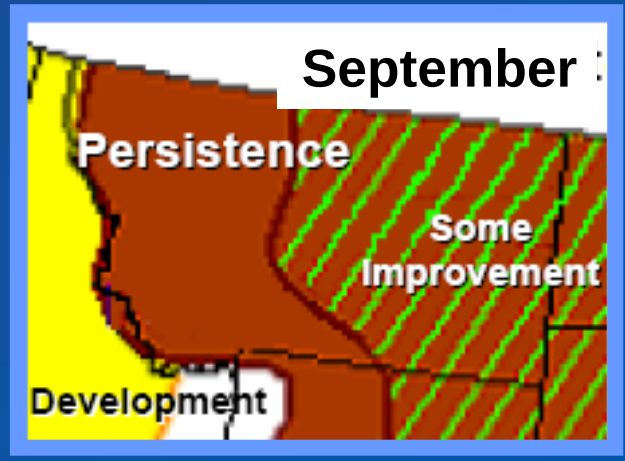
Drought Outlook through January

Issued October 19, 2006



- Persistence expected over most of Montana
- Some improvement expected southeast





In Summary...

- **September brought much needed precipitation**
  - ***Especially to eastern Montana***
- **Water year ended with near normal precipitation over most of state**
  - ***Small areas below normal***
- **Crop Year moisture lacking**
  - ***Most of state below to well below normal***
  - ***September precipitation brought some improvement south central, east, northeast***
- **Continued chances for precipitation for at least the next week**

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Glacier National Park from Duck Lake